

Amendments to the Claims

Applicants submit this Preliminary Amendment with the National Phase application enclosed herewith, under 35 USC § 371(g), and requests that the following amendments be entered. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A device for optically connecting two coaxially opposingly disposed optical fibers for the purpose of transmission of an optical signal, the device comprising a ferrule; said ferrule comprising:
 - a) a longitudinally extending cylindrical body made of Shape Memory Material (SMM), said body having a middle portion, said middle portion having a first end and a second end, a first connection clamp and a second connection clamp, said connection clamps ~~are being~~ located on either end of said middle portion, each connection clamp having a free end associated therewith, said body and said connection clamps also having a bore that traverses a central axis through said connection clamps and said middle portion, ~~and~~ said bore having a diameter slightly smaller than the diameter of the optical fibers to be connected,
 - b) said body also having one of more pairs of longitudinal slots that traverse the diameter of said body, each of said pair of slots beginning within a connection clamp and extending to the free end of the other connection clamp, ~~and wherein, if there is more than one pair of slots, at least one pair of the slots commence at a same connection clamp different from that of the at least other pair of slots; and,~~
 - c) a first cap and a second cap comprising a wire whose diameter is approximately the same as the diameter of the optical fiber, such that said

~~cap wires are inserted~~ when inserted into the said bore of the said body from each side, and said cap wires ~~are penetrating~~ penetrate into the ferrule from each side, and ~~said cap wires are abutted~~ abut on each other at the middle of the length of the body of the ferrule.

- 2 (original) The device of claim 1, wherein each of said connection clamps have, at their respective free ends, a conic end penetrating along the axis of each said connection clamp.
3. (currently amended) The device of claim 1, wherein said device middle portion has conic grooves forming a ring around the junction between the first and second connection clamp and the middle portion, said conic grooves penetrating inside the first and second connection clamps.
4. (currently amended) The device of claim 1 wherein said pairs of slots form an angle α which value that is between 25° and 90° .
5. (currently amended) A tool for deforming a device, the device according to ~~of the type defined in~~ claim 1, the tool comprising:
 - a) two internal grips, each grip adapted to ~~that engage with the~~ a connection clamp at the junction of the connection clamp and ~~ends on~~ the middle portion of the ferrule ~~of claim 1~~;
 - b) two external grips, each grip adapted to ~~that engage with the~~ free end of the connecting clamps of the ferrule; and
 - e) wherein, said internal and said external grips are being traversed by a passage that allows optical fibers and cap wires to be removed from the ferrule or inserted in said ferrule.

6. (currently amended) A tool for deforming a ferrule having a first connection clamp and a second connection clamp, each connection clamp having a free end and a central portion disposed at the juncture of the connection clamp and a middle portion of the ferrule, each free end having a conic recess and each central portion having a conic groove ~~device of the type defined in claim 1~~, the tool comprising:

- a) two internal grips shaped in a conical point that engage with the complementary sections of the conic grooves on the central ~~middle~~ portion of the ferrule ~~of claim 3~~;
- b) two exterior grips that engage with the conic ends located at the free ends ~~end~~ of the connecting clamps of the ferrule ~~of claim 2~~;
- e) wherein, said conical point of the said internal grip and said external grips being traversed by a passage that allows optical fibers and cap wires to be removed from the ferrule or inserted in said ferrule.

7. (currently amended) A method for deforming a ferrule having a first connection clamp and a second connection clamp, each connection clamp having a free end and a central portion, the central portion disposed at the juncture of the connection clamp and a middle portion of the ferrule, each free end having a conic recess and each central portion having a conic groove, ~~of using the device of claim 1, in combination with the tool of claim 5~~, the method comprising the steps of :

- a) providing a tool having two internal grips adapted to engage with the complementary sections of the middle portion of the connecting clamps, two external grips that engage with the free ends of the connecting clamps, and a central passage that allows optical fibers and cap wires to be inserted and removed from the ferrule;

b) ~~a)~~ engaging the two internal grips of ~~on~~ the tool with the ends of the middle portion of the ferrule causing the slots and the diameter of the bore to expand at said middle portion;

c) ~~b)~~ engaging a first external grip of the tool with the first connection clamp of the ferrule, to increase ~~which causes~~ the diameter of the bore in the first connection clamp ~~to increase~~,

d) ~~e)~~ removing the first cap wire from the first connection clamp and inserting a first optical fiber into the bore until it is abutted against the second cap wire, said second cap wire ~~and~~ being maintained in position by the second connection clamp;

e) ~~d)~~ removing the first external grip, so that the first connection clamp on the ferrule closes on the first fiber and maintains it in place;

f) ~~e)~~ engaging the second external grip of the tool with the second connection clamp of the ferrule, to increase ~~which causes~~ the diameter of the bore in the second connection clamp ~~to increase~~;

g) ~~f)~~ removing the second cap wire from the second connection clamp and inserting a second optical fiber into the bore, causing ~~and~~ said second optical fiber to be ~~is~~ abutted against the first optical fiber;

h) ~~g)~~ removing the second external grip from the second connection clamp of the ferrule so that the second connection clamp of the ferrule closes ~~closes~~ on the second optical fiber and maintains it in place; and

i) ~~h)~~ removing the two internal grips from the ends of the middle portion

of the ferrule, causing the middle portion of the bore to shrink on the optical fibers to centre them in front of each other for light transmission, and ~~at the same time~~ causing the ~~that~~ length of the middle portion of ferrule to decrease, said length decrease creating sufficient force to firmly abut the fiber ends ~~fibers end~~ on each other for light transmission.

8. (currently amended) A method according to claim 7, wherein the internal grips are shaped in a conical point for engaging complementary sections of the conic grooves and the exterior grips engage the conic ends located at the free ends of the connecting clamps.

~~of using the device of claim 1, in combination with the tool of claim 6, the method comprising the steps of:~~

~~—— a) —— engaging the two internal grips on the tool with the complementary conic grooves located at the ends of the middle portion of the ferrule causing the slots and the diameter of the bore to expand at said middle portion;~~

~~—— b) —— engaging a first external grip of the tool with the conic end on the first connection clamp of ferrule, causing the diameter of the bore in the first connection clamp to increase;~~

~~—— c) —— removing the first cap wire from the first connection clamp and inserting a first optical fiber into the bore until it is abutted against the second cap wire, said second end being secured in position by the second connection clamp;~~

~~d) — removing the first external grip so that the first connection clamp on the ferrule closes on the first fiber securing it in place;~~

~~— e) — aging the second exterior grip of the tool with the conic end on the second connection clamp of ferrule, causing the diameter of the bore in the second connection clamp to increase;~~

~~— f) — removing the second cap from the second connection clamp and inserting a second optical fiber into the bore, and said second optical fiber is abutted against the first optical fiber;~~

~~— g) — removing the second external grip from the conical extremity of the second connection clamp of the ferrule so that the second connection clamp of the ferrule closes on the second optical fiber securing it in place; and~~

~~— h) — removing the two internal grips from the two conical grooves of the middle portion of ferrule, thereby causing the middle portion of the bore to shrink on the optical fibers to centre them in front of each other for light transmission, and at the same time causing the length of the middle portion of the ferrule to decrease, said length decreasing to create sufficient force to firmly abut the fibers end on each other for light transmission.~~

9. (currently amended) A method of using the ferrule device of claim 1 in combination with the tool of claim 5; to remove the fibers held in the ferrule in order to reuse the device, comprising:

a) providing a tool having two internal grips adapted to engage with the complementary sections of a central portion of connecting clamps of a ferrule, two external grips that engage with the free ends of the connecting clamps, and a

central passage that allows optical fibers and cap wires to be inserted and removed from the ferrule; and

b) engaging the ferrule with the tool;

c) actuating the tool to loosen a fiber held in the ferrule; and

d) removing a fiber.

10. (currently amended) A method according to claim 9, wherein the ferrule includes conic grooves disposed in a central portion, the internal grips are shaped in a conical point for engaging complementary sections of the conic grooves, and the exterior grips engage conic ends located at the free ends of the connecting clamps. ~~of using the device of claim 1, in combination with the tool of claim 6, to remove the fibers in order to reuse the device.~~
11. (currently amended) A method according to claim 9 wherein the ferrule further comprises connection clamps having at their respective free ends, a conical recess coaxial with the bore of each said connection clamp, said recess for receiving the deforming tool. ~~of using the device of any one of claims 2 and 3, in combination with the tool of claim 5, to remove the fibers in order to reuse the device.~~
12. (currently amended) A method according to claim 10 wherein the ferrule further comprises connection clamps, each clamp having a free end with a conical recess coaxial with the bore of each said connection clamp, said recess for receiving the deforming tool. ~~of using the device of any one of claims 2 and 3, in combination with the tool of claim 6, to remove the fibers in order to reuse the device.~~

13. (new) A method according to claim 9, wherein the ferrule further comprises connection clamps having conic grooves disposed in a central portion, the conic grooves for accepting the deforming tool.
14. (new) A method according to claim 10, wherein the ferrule further comprises connection clamps having conic grooves disposed in a central portion, the conic grooves for accepting the deforming tool.
- 15 (new) The device of claim 1, further comprising a body having a plurality of pairs of slots.
- 16 (new) The device of claim 15, wherein each slot of at least a first pair of slots commences at the first connection clamp and each slot of at least a second pair of slots commences at the second connection clamp.